Volume Six, Number Four December 1972

THE RHODESIAN JOURNAL OF ECONOMICS

The Quarterly Journal of the Rhodesian Economic Society

SYMPOSIUM PROCEEDINGS
CURRENT ECONOMIC PROBLEMS

November 2: LABOUR ISSUES
November 3: EXPORT DEVELOPMENT

ARTICLES **Page**

LABOUR PROBLEMS IN RHODESIA

EXPORT DEVELOPMENT

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Articles *Contributors*

EXPORT DEVELOPMENT

The Mining Industry as an Exporter

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THE RHODESIAN MINING INDUSTRY AS AN EXPORTER

C. A. GIBSON

In looking at the Rhodesian mining industry it is clear that the industry has to export to survive; our own economy has not developed, and will not do so in the foreseeable future, to the stage where it can absorb any but a small proportion of the metals and minerals produced domestically. Thus the industry is export oriented not through choice but through necessity.

There are, of course, various mineral products that are used locally in large tonnages such as iron ore, coal, limestone and the like but these are low price commodities and financially are of relative unimportance compared to the total value of mining exports. At the other end of the scale there are the far more valuable products of our mining industry such as gold, copper, tin and nickel that are used locally but these belong to the category where the domestic off-take is so limited as to be of no financial significance.

Thus it is, that, as far as the mining industry is concerned, it is not a question of determining how it can develop an export market but a question of how it can survive and prosper in the international markets on which it depends.

This of course is not untypical of mining as an industry—by and large the major industrial nations, those of North America, Europe and Japan have established their position by processing the raw materials they could import from more backward and less developed parts of the world. They may have started off by utilising their own resources; the Industrial Revolution in Britain was based on the then adequate reserves of coal and iron ore in Midland England; while in Germany the indigenous reserves of iron ore and coal were sufficient to give birth to the Ruhr—but as these industrial nations developed, as metallurgy progressed and as needs became more sophisticated, the industrial nations began to cast further afield for the more exotic as well as the more common requirements of their manufacturing industries.

This is nothing new, for we can look back to the days before Christ to see tin being exported from Cornwall to Phoenicia, emeralds being exported from Egypt to Rome, gold from Central Africa to India and to Egypt—there has always been this movement of raw materials from underdeveloped areas to centres of sophistication.

The history of the Rhodesian mining industry follows such a pattern and in order to put the present, and as far as I can, the future, into perspective, I intend to have a brief look at the history of our industry.

One of the attractions and temptations of Rhodesia was the lure of gold. It was in search of gold that the early settlers made their way here, and the first gold returns were made in 1896 when 6 196 ozs. were produced. From then on gold production increased steadily. In 1910 the country's gold output was valued at £300 000 and by 1915 this had grown to £4 000 000 when Rhodesia had a significant place in the world as a gold producer.

Although during this period interest was concentrated on gold it was not restricted to it and prospecting for other minerals was extensive if not intense. As a result, the mining of chrome, coal and copper started in the years between 1904 and 1907 and mining of asbestos started in 1908. These were not the only minerals to be mined at that time but they were the ones which were to have an important future part to play in the industry. However, that time had

not yet arrived and despite these other activities, gold remained the principal mineral product right through into the 1940's. So much so that in 1940, out of the total mineral output valued at £9,2 million, £7 million came from gold.

Then in the late 1940's, subsequent to the Second World War, the position began to change dramatically. Asbestos production and revenue began to increase rapidly and in 1952, gold, for the first time, lost its long held position of main mineral product to asbestos. At the same time chrome products and revenue also increased and in 1952, of a total mineral revenue of £17 million, £6,1 million came from asbestos, £6 million for gold and £4,1 million from chrome—95% of our mining revenue from three minerals.

And so the position remained for 5 or 6 years with asbestos in the lead, gold close behind and chrome a lagging third, until, in the late 1950's, copper made a sudden and dramatic impact on the Rhodesian economy. Copper had been produced in Rhodesia between 1907–1954, in minor amounts and erratically, but in the short space of 8 years, from 1957–1965, Rhodesian copper production increased from £300 000 to £6,1 million.

Thus it was that the 1950's saw Rhodesia's mining industry move out of 50 years of dependence on a single mineral, gold, into a period of developing growth, where, although gold still held an important position, it was only one of four major products; the others being asbestos, copper and chrome. The growth was both steady and rapid and by 1965, the year of Independence, the annual value of Rhodesia's mining output was $64 000 000. Of this total, asbestos made the major contribution of $17 million (27%), gold was second with $13,6 million (21%), and copper was third with $12,6 million (20%). Coal contributed $7,6 million (12%) and chrome $5,2 million (8%). While these five were the giants of the industry, three other products were of significance; iron ore at $2 million, tin at $1,4 million and lithium at $0,8 million. These eight mineral products, asbestos, gold, copper, coal, chrome, iron ore, tin and lithium together, contributed $60 million or 95% of the total $64 million of Rhodesia's mineral output in 1965. The balance of $4 million was made up by some 50 different minerals among them being beryl, tungsten, tantalite, mica and iron pyrites.

That was the position in 1965. However, by 1971, the total value of Rhodesian mineral output had grown to $101 million. This phenomenal growth was due to the expansion of already existing mining operations, to the development of new copper mines such as the Inyati and the Ell and to what is probably the most significant development in Rhodesian mining history to date, the opening up of economic nickel deposits at Empress, Trojan and Madziwa.

Thus we can see three clearly defined stages in the development of Rhodesia's mining industry.

Period	*Elapsed Time in Years*	*Value Range during period* $	*Growth during period* $	*Average growth $m per year*
1900–1945	45	0,5m– 16m	15,5m	0,34
1945–1965	20	16m– 64m	48m	2,4
1965–1971	6	64m–101m	37m	6,2

Table showing value of Rhodesia's mining output during three separate periods between 1900 and 1971.

Basically our interest today must be in what the future holds for the Rhodesian mining industry and what steps can be taken to increase its export potential; there is no doubt that our mining industry will have a steadily growing part to play in the domestic economy, be it in the provision of minerals for primary industry, such as coal for power generation or iron ore for steel manufacture, or in the provision of rather more exotic materials such as talc for the pharmaceutical industry or glitterstone for swimming pool surrounds; but there can be little doubt that, for the remainder of this century, at least, the mining industry will find its principal outlets in the export market.

There are a variety of ways in which the industry can increase its export potential but the four I wish to discuss are:

(a) Increased exploitation of existing deposits.
(b) Discovery and exploitation of new mineral deposits.
(c) Greater beneficiation of mineral products.
(d) Improved marketing practices.

(a) Increased Exploitation of Existing Deposits

I believe that there is little potential for increased exploitation of existing mining operations in Rhodesia. The majority of large mines are operating at well designed levels, levels which will enable them to operate over a reasonable life while at the same time ensuring an acceptable return on capital. It would no doubt be possible in certain cases to greatly increase the output of various of our mines but in view of the finite ore reserves that each mine has, this would have the effect of reducing the life of the mine in proportion to the rate at which one increased output. Taking each operation as an isolated financial case, such an approach might be attractive, in that it could give a much improved rate of return on the operation, but socially it would be both irresponsible and impracticable. All industries are anxious to create an environment of stability and to establish a pattern of continuity; the overly rapid exploitation of mineral deposits might well make for very high financial return but in the long run would be self-destructive for the process would neither encourage the establishment of a stable mining community nor would it permit continuity if exploitation were taking place at a greater rate than new deposits were being discovered.

I do not believe therefore that there is wide scope for any greatly increased output from those large scale mines at present in operation.

(b) Discovery and Exploitation of New Mineral Deposits

It is in this second field, the discovery and exploitation of new mineral deposits, that I believe the greatest progress in the industry is going to be made over the next 20 years. We have seen how relatively stagnant the industry was from 1900–1945 and how dependent it was on the one mineral product, gold. Indeed it was common comment up to 1945 to say that Rhodesia was the poor cousin of Southern African mining—that Zambia and South Africa to the north and south had great mineral riches but that Rhodesia had missed out and was forever doomed to being no more than a middle rate gold producer. Anyone who thought otherwise was considered to be more fool than optimist. But now there are in Rhodesia, asbestos, copper and nickel mines of international dimensions, mines that any nation would be pleased to have, and in

the period of 26 years from 1945 we have seen mineral production increase from $16 million to $101 million, a rate of increase of $3 million per annum.

Perhaps, therefore, people are now prepared to believe that the future holds even more glowing promise and I believe that the next 20 years will see a transformation in the Rhodesian mining industry as great, if not greater, than that which has taken place over the last 20 years.

In particular there are considerable possibilities for the development of new nickel mines, for the opening up of new, large, gold deposits and for the exploitation of the long known platinum deposits of the Great Dyke.

Of these the most certain are the new nickel operations. Already it has been announced that Johannesburg Consolidated Investments will open up the Shangani and Damba discoveries in Matabeleland; bearing in mind the geological picture, it is almost inevitable that at least one more nickel deposit will be discovered within the next decade; so that in 10 years time we might see three more nickel mines in operation. On this basis we could eventually have an increased overall production of nickel which could be worth an additional Rh$35 million/year.

As regards gold, I believe that if the price reaches US$80 per oz. at least 2 large, low grade, open pit gold mines will come into operation. If these were to average 2,5 dwts/t. and each milled 1 million tons of ore per year, they would, at 90% recovery, produce 225 000 ounces of gold per year and at the price I have mentioned, bring in a revenue of some Rh$12 million per year.

The last of the trio, platinum, is no less a possibility than the other two. For years the presence of platinum in the Great Dyke has been known but no serious exploration of the platinum horizon was carried out. With the growing interest in platinum, particularly in regard to pollution control, it is inevitable that exploration will be directed at the platinum horizon of the Great Dyke and it is quite conceivable that within the next 10 years we will see two platinum mines in this country. If these two mines were each to mill 100 000 tons/month at a grade of 2,5 dwts/ton and at a recovery of 75%, then we would have an annual production of 225 000 ozs., which at today's price of US$130/oz., would be worth about Rh$19 million.

While I speak of the very real possibilities of finding additional occurrences of nickel and of gold and of finally exploiting the long known platinum horizon, we must not forget two of the well established mineral products of this country —copper and chrome. Although copper was produced in only minor quantities prior to 1954, the metal is today a major product, bringing in well over Rh$10 million per year. Copper is now mined at various locations in Rhodesia and the possibility of finding further significant deposits is just as real as it is for nickel.

As regards chrome, we have in the Great Dyke the largest reserves in the world of high quality chrome ore. This ore is particularly suited to the manufacture of high carbon ferro-chrome and the current trend in the stainless steel industry, particularly in view of the increasing use of AOD furnaces, is for an increasing demand for high carbon ferro-chrome. In the face of this demand, and in view of the limited availability of such high grade ore elsewhere in the non-Communist world, it seems inevitable that there should be an increasing demand for Great Dyke ore so that this, too, in future, should add still more to the export revenue of the mining industry.

Looking then at the mining industry as it stands, and bearing in mind the potential for additional nickel, gold, copper and chrome production and for

the introduction of new mineral products such as platinum, it seems that, well within the current century, the Rhodesian mining industry will be producing twice the 1970 figure and will have reached the magical Rh$200 million figure. Some may have smiled in disbelief when this figure was first mentioned some years ago, but they might well be the descendants of those who smiled in 1945 when anyone had the temerity to say that Rhodesia would be any more than a Rh$14 million a year gold producer.

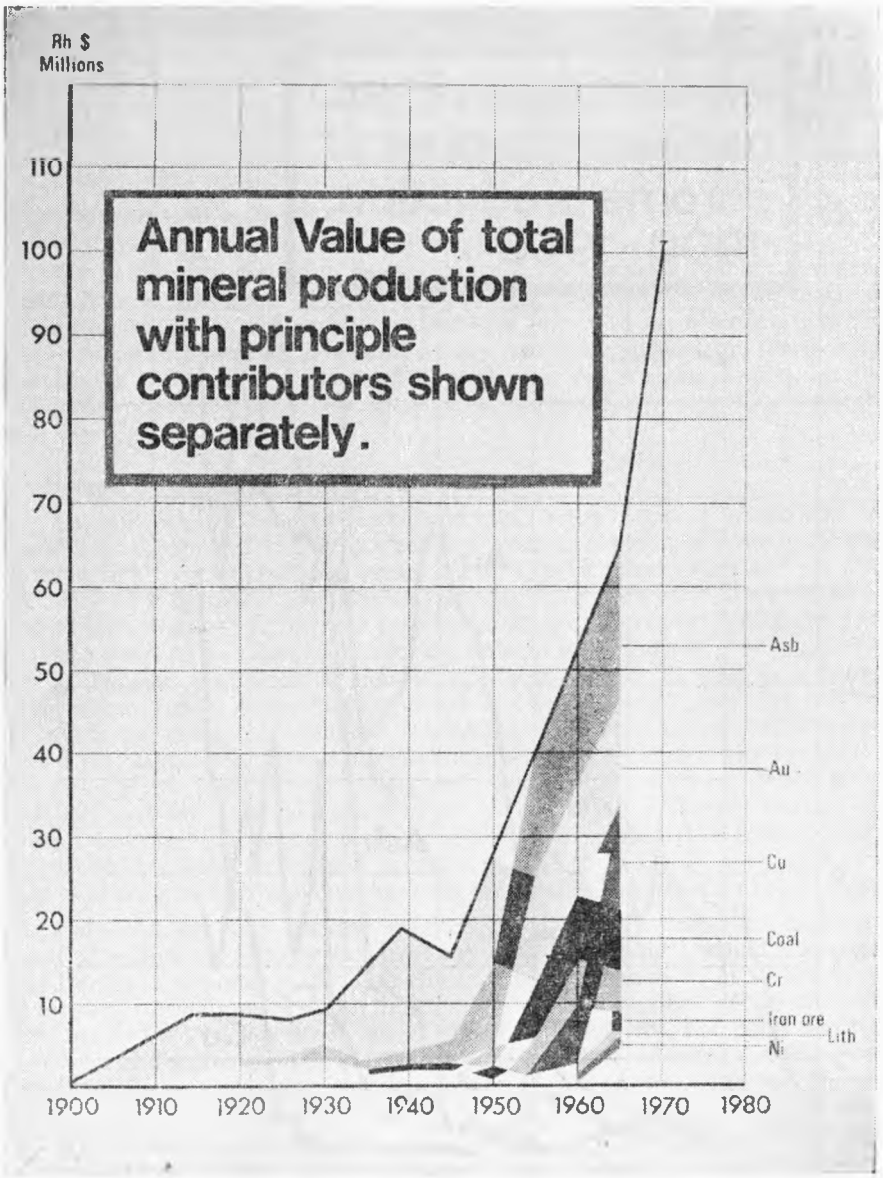
While some of the deposits I have mentioned are already known and are on the point of exploitation, others of them have yet to be delineated or discovered. An essential in the location of these latter deposits is active exploration and research work at all levels; Government, University and Industry. Taxpayers and shareholders, Government and the mining industry must be prepared to ensure that vigorous exploration programmes with the highest calibre men, with the most efficient equipment, using all the available modern techniques, are pursued relentlessly, for it is only in this way that the industry can reach its full potential.

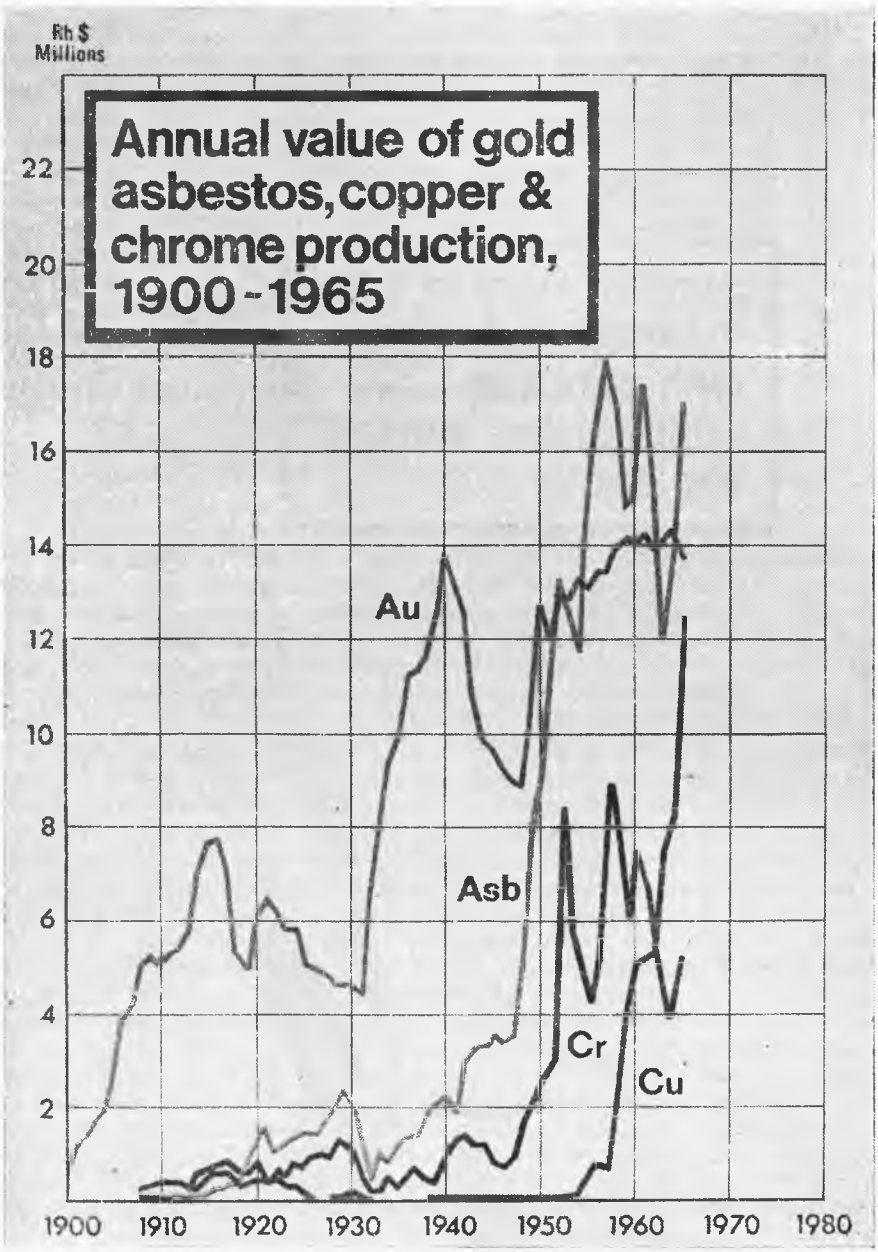
(c) **Greater Beneficiation of Mineral Products**

While the great part of the future of the industry depends on the location of new mineral deposit the third way, that of beneficiation of mineral products, also presents a way in which the export earning capacity of the industry can be increased.

In its simplest terms, beneficiation means the upgrading of an ore mineral by the removal of unusable impurities. There are numerous advantages to beneficiation and among the most important are that it results in a more saleable product, it results in a higher priced product and it results in a much less bulky product so that transport costs are reduced. In general then, it is desirable to produce as greatly a beneficiated product as possible, provided that the added costs arising from financing charges and operating costs are less than added sales values together with the benefit of lower freight costs.

A further major advantage is that the establishment of beneficiation processes has tremendous national advantages, particularly in the growth of employment opportunity and the further development of the general infrastructure. It is my belief therefore that every effort should be made to carry the beneficiation of our mineral products to as a high a level as is economically practicable. There is of course a limit to the amount of beneficiation we can carry out and this level, dictated by market conditions, is the point where product demand is split into uneconomic consumer units. We could, for instance, easily produce stainless steel in this country but the national off-take would be so limited that it would be insignificant and the operation would have to be entirely export oriented. However the stainless steel consumers have a very wide range of alloy requirements coupled with a need for ready stock availability close to the point of consumption. A Rhodesian producer could neither economically produce the wide range the market requires, nor meet the short term delivery requirements and thus we reach our currently practicable level of beneficiation, as far as the stainless industry is concerned, that of providing some of the input materials such as nickel and ferro-chrome. Rhodesia has gone a long way on the road to beneficiation; prior to the great leap forward of the '50's we had, except for gold, few major beneficiation plants. What copper we had produced had been sold, as ore or as concentrates, tin had been sold in concentrate form, chrome had been sold as ore and what nickel we had produced, which had come from sources other than those now operating, had


Rh $
Millions
110
100
90
80
70
60
50
40
30
20
10
Annual Value of total mineral production with principle contributors shown separately.
Asb
Au
Cu
Coal
Cr
Iron ore
Lith
Ni
1900
1910
1920
1930
1940
1950
1960
1970
1980


Rh $
Millions
Annual value of gold asbestos, copper & chrome production, 1900 - 1965
22
20
18
16
14
12
10
8
6
4
2
Au
Asb
Cr
Cu
1900
1910
1920
1930
1940
1950
1960
1970
1980

been sold as concentrates.

Happily the mining industry has seen the very considerable advantage of beneficiation and today the bulk of our major products are beneficiated to the highest possible degree.

There are, however, many other minerals we export, where currently production is too limited for us to consider beneficiation, but it would be wrong of us to adopt a self satisfied air concerning the progress we have made to date and assume that no more can be done. We must keep ourselves abreast of developments and be ever ready to introduce new processes, to manufacture new products as and when economic factors either dictate the need or indicate the possibility of doing so. Although the time may not yet be ripe for it, at some time in the future the industry will be able to contribute even more to the nation's exports by the production of beryllium-copper, of ferro-nickel, of ferro-nickel-chrome and other similar products.

We could, too, consider the possibility for a jewellery manufacturing industry here in Rhodesia—we have ample gold and silver, we have the finest quality emeralds in the world for their size, we have an abundance of fine semi-precious stones and, I believe, a very real possibility of the discovery in due course, of economic diamond deposits—energy, market knowledge and techniques combined with these resources could give rise to a jewellery industry of major significance.

(d) **Improved Marketing Practices**

Last on my list, but not least important, is the question of markets and marketing. We have seen over the last two years a recession of some magnitude in the major economies of the world and as a result the demand and price for products such as nickel, chrome and copper have been at a low ebb. It has been driven home quite forcibly to Rhodesian producers that unlike the good old days when all you had to do was dig up gold and someone gave you money for it, the new generation of mineral products have to be sold in a fiercely competitive market. And, what is more, it is a market quite beyond the control of Rhodesian producers. While it is possible that in the future Rhodesia will play a very significant part in the establishment of a price structure for chrome ore and chrome products this is certainly not the case with any other of our products and we must therefore adjust ourselves to a market outside our control and we must protect and encourage those markets we have. Markets are not gaping holes into which products can be stuffed, they are rather more akin to delicate, sensitive plants that have to be carefully tended and encouraged.

I do not say this because markets are currently depressed and some remedial action needs to be taken—I say it as something I would say at any time, boom or depression. By carefully tending one's markets at all times, one establishes a relationship with consumers, an atmosphere of co-operation develops and a two-way exchange of information follows. The good marketer hears of and discerns changes in trends and of new developments and techniques far sooner than the couldn't-care-less seller and is far better equipped, through better knowledge of the market, to ensure that his product is always up to standard. There is, for instance, no point in having masses of low-carbon ferro-chrome to sell if, as is happening now, steel makers are moving over to AOD furnaces and therefore the market for low carbon ferro-chrome is static or even shrinking, while the demand for high carbon ferro-chrome is increasing.

We must maintain constant contact with our buyers, helping where we

can, to overcome particular problems, finding out what is that buyers do and do not like and doing our best to meet their requirements. We must maintain high quality standards, we must maintain regular deliveries and we must not fall into the trap of believing that because we produce primary products that the industrial world needs, the industrial world has to have *our* products—they don't—they can and will quite readily take someone else's if they can get an equal or better product with better service.

Finally, one should perhaps look at the political environment, for this affects all aspects of the mining industry; exploration, exploitation, beneficiation and marketing. To encourage the investment of foreign capital in our ever expanding industry, and to satisfy buyers that continuity of supplies can be assured, it is necessary that the law, in so far as it effects the industry, and the political philosophies in the country ensure stability in the industry.

If we wish to see the continued growth of the mining industry, if we wish to see intensified exploration, if we wish to be assured of long term markets, then we must be able to ensure stability, it must be transparently clear that there is no danger of nationalisation, it must be certain that repatriation of dividends will be permitted and it must be obvious that the local infrastructure of electricity, water and transport will be developed to keep pace with the advance of the industry itself. Rhodesia has always enjoyed a good name in these respects and we must ensure that no action is taken that would cast any hint that the basis on which the industry operates would be significantly changed.

I acknowledge that there are many other factors that effect the mining industry and its export potential, but I have outlined what I believe to be the most important factors.

We must push the exploitation of those mineral deposits which we know to exist in this country; we must strive for as intensive as possible an exploration programme to locate further new mineral deposits; we must produce as beneficiated and as high quality a product as possible; we must treat our markets with care and attention and we must encourage a stable political and fiscal policy. In doing these things, we will see the mining industry grow beyond recognition.